

Innovative Reduced Mass TPS Designs for Human-Rated Aeroassist Vehicles, Phase I

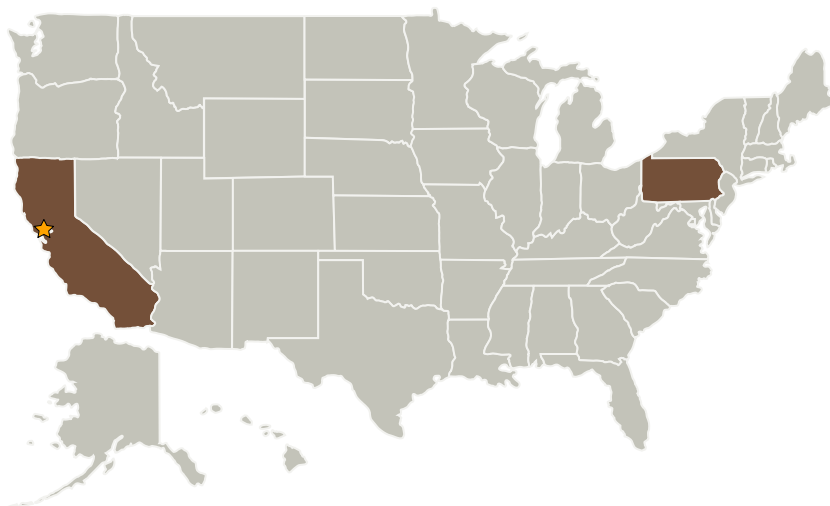
Completed Technology Project (2006 - 2006)



Project Introduction

This proposal addresses Item #2 of Topic X7.04 Aeroassist Systems and proposes innovative heat shield thermal protection systems (TPS) designs for human-rated aeroassist vehicles returning to Earth from the Moon and Mars. The proposed designs 1) utilize concepts with and without outer ablator materials, 2) employ outer refractory composite material rib-stiffened aeroshells with low emissivity foils on their internal structure to trap the heat and act like a high thermal resistance material, similar to multi-layer insulation but which have the potential to be less complex and less dense, and 3) make use of re-usable refractory composite materials that will be non-parasitic and structurally functional within the heat shield, thereby offering the promise of significantly reducing TPS mass fraction. The following will briefly describe the base heat shield used in Apollo Command Module and discuss the two alternative concepts and why they are advantageous.

Primary U.S. Work Locations and Key Partners



Organizations Performing Work	Role	Type	Location
★Ames Research Center(ARC)	Lead Organization	NASA Center	Moffett Field, California
Materials Research and Design, Inc.	Supporting Organization	Industry	Wayne, Pennsylvania



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Organizational Responsibility

Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

Lead Center / Facility:

Ames Research Center (ARC)

Responsible Program:

Small Business Innovation Research/Small Business Tech Transfer

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Primary U.S. Work Locations

California

Pennsylvania

Project Management

Program Director:

Jason L Kessler

Program Manager:

Carlos Torrez

Technology Areas

Primary:

- TX14 Thermal Management Systems
 - └ TX14.3 Thermal Protection Components and Systems
 - └ TX14.3.2 Thermal Protection Systems